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ABSTRACT

The traditional methods for documenting educational achievements have limited application for prescribing desirable and mandatory educational prerequisites for service in the various officer utilization fields of the Air Force. The document describes an educational profile that was developed to display a candidate's educational achievements in a simple, standard, quantified format. Problems presented by the current system of assessing educational qualifications are discussed. The education profile has the following characteristics: (1) it displays all essential information of the candidate's college education in a simple standard format, (2) data are quantified whenever possible, (3) it permits fine discrimination in areas of Air Force interest, and (4) it expands to form the basis of a permanent education record for the duration of an officer's career. The research indicated that college transcripts can be condensed and quantified into educational profiles with a high degree of reliability, particularly in some utilization fields. One-half of the document contains the following appended materials: (1) officer education profile and definition of education categories profile, (2) profile score sheet, (3) instructions for use of profile score sheet, (4) typical completed officer education profile, and (5) predictor variables used to quantify data in educational profiles. (Author/EC)

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MATCHING JOB EDUCATION REQUIREMENTS WITH CANDIDATES' EDUCATIONAL ATTAINMENTS—A PILOT METHODOLOGICAL STUDY

By

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December 1975
Interim Report for Period 1 November 1974 – 31 August 1975

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The traditional methods for documenting educational achievements have limited application for prescribing desirable and mandatory educational prerequisites for service in the various officer utilization fields. There is no standard terminology or format for the various colleges throughout the United States of America, and so the college transcript is an ambiguous document. This report describes an education profile that was developed to display a candidate's educational achievements in a simple, standard, quantified format. It was found that the data in college transcripts could be condensed into these profiles with a high degree of reliability.

It was also demonstrated that a sample of "experts" could rate, with a high degree of interrater reliability, a collection of such profiles on educational suitability for service in the Administrative Officer Utilization Field

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(AFSC 70XX). Furthermore, regression analysis established that these ratings (or "educational suitability indexes") could be satisfactory duplicated by mathematical equations using a limited number of aspects of the education profiles as predictor variables.

This was a pilot methodological study. Hence, the sample of raters used was not random, and only one utilization field was studied. However, the results are sufficiently convincing to justify further research. The findings supported the feasibility of developing a series of mathematical equations for computing, from education profiles, educational suitability indexes for each of a variety of utilization fields.

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MATCHING JOB EDUCATION REQUIREMENTS WITH CANDIDATES' EDUCATIONAL ATTAINMENTS - A PILOT METHODOLOGICAL STUDY

I. INTRODUCTION

As with other military organizations, the United States Air Force promulgates education qualifications for assignment to and service in the various officer utilization fields (AFM 36–1 & AFM 50–5). Some of these qualifications are listed as being desirable, others as mandatory. The implication is that some educational backgrounds are more suitable for service in particular utilization fields than are others, an implication with face validity. This report identifies limitations of the present system for specifying these qualifications, and proposes an alternative methodology.

II. ANALYSIS OF THE PROBLEM

Typically, educational requirements for officer utilization fields are expressed in terms of possession of a particular degree, sometimes also specifying particular subjects that should be included in that degree. To illustrate, AFM 36–1 gives the education qualification for the pilot and navigator specialties as: "Bachelor of Science degree with appropriate courses in physical science, mathematics, administration, and management is desirable."

To illustrate some of the limitations of the present system, Table 1 was prepared from data gathered in this study. It breaks down five actual college degrees by the number of semester hours in the various

Table 1. **Content of Five Actual College Degrees**

Degree Identification Number	1	2	3	4	5
Type of Degree	BS	BS	BS	BA	BA
Semester hours in Mathematics	28	15	9	6	39
Semester hours in Engineering	51				
Semester hours in Physics	11				8
Semester hours in other physical sciences	8	15	3	6	
Semester hours specifically designated Administration or Management	3	18	6	4	3
Semester hours in Business Studies	19	14			20
Semester hours in Military Studies	15	30	38	41	15
Semester hours in other subjects	18	44	83	72	50
Grade Point Average (GPA)	3.22	2.06	2.12		3.25

areas of study relevant to the stated desirable education qualifications for pilots and navigators. It includes the type of degree awarded, and the grade point average (GPA) when available.

The first three degrees in Table 1 fit the stated education qualifications for pilot/navigator; the last two have the desired subjects but they are arts degrees, not science degrees. The third and fourth degrees are virtually identical, but one is an arts degree and the other is a science degree. This illustrates the first limitation of the present system. What is a science degree from one college may be an arts degree from another. This being the case, the validity of specifying a science degree in preference to an arts degree must be questioned.

A second limitation of the present system is that it permits only dichotomous decisions. Either a candidate has the stated qualification, or he does not. There is no consideration of degree of suitability. For example, the first three degrees in Table 1 all meet the requirements for service as a pilot or navigator, and so each is presumably equally suitable. The low Mathematics/Physics content of the third degree, and the barely passing GPAs of the second and third, apparently have no relevance.

The problem of using college education for officer assignment is further compounded by the fact that the only documentary evidence of educational attainment is the candidate's college transcript. This can be a highly confusing source of information, since the several thousand colleges in the United States have no standard terminology in the transcripts. They use the same names for different courses, different names for the same courses, different standards and scales for assessing and reporting quality of academic attainment, and so on. The transcript, while it is a suitable vehicle for comparing the academic attainments of a few candidates, is totally unsuited for use on the scale needed for Air Force officer assignment.

The officer utilization field assignment process might be viewed as one of matching pegs to holes. There is a pool of candidates (pegs) comprising officers entering the service, and serving officers being considered for re-assignment. Each member of this pool has a unique combination of attributes, one of which is educational attainment. On the other hand, there are vacancies in the various utilization fields (holes) that are to be filled. Each of these has its own unique combination of characteristics which imposes demands on the mandatory and desirable attributes of potential assignees, including educational background. A one-to-one match between the education qualifications held by the various members of the pool of candidates and the educational requirements of the various holes is impossible. In fact, earlier research by the Air Force Human Resources Laboratory revealed that for many utilization fields this match is quite poor. Many candidates are being assigned to fields for which they do not meet the educational requirements stated as being desirable.

To avoid assigning officers to fields where their college education has little practical value and for which they have little academic affinity, and to make the best match of existing talent to established vacancies, there is a need for a systematic methodology for expressing the educational background of a candidate in terms of degree of education suitability for each of the various utilization fields. The coarse, ambiguous, dichotomous system presently used does not meet this need. The research reported in this report establishes the feasibility of an alternative methodology that might. Its specific aims were:

1. To design an "education profile" by means of which both the quantity and quality of an officer's college education, as evidenced by his college transcript, could be condensed into a standardized, manageable display.
2. To measure the reliability with which college transcripts could be translated into the profile format.
3. To develop a set of profiles from the transcripts of a sample of officers recently commissioned into a wide range of officer utilization fields.
4. To have this set of profiles rated by a panel of "experts," on the educational suitability of each officer for assignment to the Administrative Officer Utilization Field (AFSC 70XX).
5. To estimate the level of agreement between panel members on the relative educational suitability of these officers.
6. To capture the policy of the panel as a mathematical model, thereby providing a system capable of automatically computing an education suitability index for candidates for the utilization field.

III. THE PROPOSED SYSTEM

The Administrative Officer Utilization Field was chosen as the vehicle for developing and testing the methodology. There were two reasons for this decision. The first was administrative convenience – there are a large number of administrative officers assigned at Lackland AFB, Texas, where the Air Force Human Resources Laboratory, Occupational and Manpower Research Division is located. Secondly, it was hypothesized that if a reasonable level of interrater agreement existed between the judges in such a heterogeneous field, there was a good chance that judges in more homogeneous areas would also show agreement in assessing education suitability for their field.

Designing an Education Profile

Since the typical college transcript was unsuitable for use by judges in assessing the relative value of the college education of large numbers of candidates, a simplified, condensed version, termed an Education Profile was designed. The experimental profile was designed to the following specifications.

1. It should display all essential information of the candidate's college education in a simple standard format.
2. Data should be quantified whenever possible.
3. It should permit fine discrimination in areas of Air Force interest.
4. It should be expandable to form the basis of a permanent education record for the duration of an officer's career.

The developed profile form is shown in Appendix A, together with the definition of each of the 20 education headings used, and sufficient examples and exclusions to permit practical use. These 20 education headings represent the smallest set by which all college courses of interest to the Air Force could be described. The specificity of the headings varies depending on Air Force requirements in that area; e.g., the heading Aerospace Engineering is much more specific than the heading Arts, Fine Arts and Humanities. This is because qualifications in aerospace engineering are much rarer than general arts-type qualifications, and as they relate to an established Air Force need there is a requirement to be able to identify them more precisely.

Appendix B shows the Profile Score Sheet used for the clerical process of counting, for entry on the Education Profile, the number of semester hours each transcript revealed under each education heading. In assigning courses to education headings, the first heading, Calculus, was considered first; all courses on the transcript were examined, and those falling within the heading Calculus (as defined) were scored; from the remaining courses, those falling within the definition of the second heading, Probability/Statistics were scored; all other mathematics courses were then designated 'Math Other' under the third heading. In like manner, each of the 20 headings was applied in sequence to each remaining course on the transcript, until finally all courses were assigned to an education heading.

By considering each transcript course title in this manner, it was possible for different judges to consistently assign even vaguely named courses to the same education heading. Three behavioral scientists from the Occupational and Manpower Research Division, including one of the authors, each scored 50 transcripts using the Profile Score Sheet and the instructions for its use shown in Appendix C. Applying the intraclass correlation technique (Lindquist, 1953) for the three raters for each of the 20 headings gave an average interrater agreement of .95. This interrater agreement indicates that there should be no major problem in converting information from the transcript to the profile format in an operational system.

Education Profiles were then prepared from the average scores on the Profile Scoring Sheets for these 50 transcripts by adding Degree, Major, College and GPA, and re-arranging the education headings into the five academic areas Mathematics, Engineering and Physics, Other Sciences, Officer Managerial Studies, and General Studies. A typical completed profile is shown in Appendix D. A further 50 profiles were then prepared from other transcripts, giving a total of 100 in all. Some profile data were unavailable as some of the college transcripts did not specify any academic major or GPA. GPA was included only for those colleges using a 4-point system. This was the commonest, but far from the only system encountered. Thirty percent of the final profiles lacked GPA information. The scores on all profiles were converted to semester

hours using the conversion factors one quarter hour = .75 semester hours, 1 unit = 1 semester hours. These factors applied for most colleges using quarters or unit systems, but in a few cases the precise factor was uncertain.

Education Suitability for Assignment as an Administrative Officer

Twenty three officers of grade second lieutenant through major currently serving in the 70XX Administration Utilization Field at Lackland Air Force Base, Texas, volunteered to assess the sample of 100 profiles and rate the candidates on education suitability for assignment as an administrative officer. These officers comprised the panel of experts for this pilot study. Each was provided with the 100 profiles (randomly sorted to avoid context effect), a letter briefly outlining the project, a copy of the education heading definitions, and a rating booklet containing instructions on what was required.

Each rater was asked to assign each profile to one of nine groups based on the education suitability it displayed. The scale for defining the groups ranged from Group 1 – most unsuitable – education has very little value (for assignment as administrative officer) to Group 9 – most suitable – difficult to improve, with all points between defined. All profiles in Group 1 then automatically were rated 1, Group 2 rated 2 and so on. It was felt that this technique of sorting as part of the rating process would give the raters more opportunity to revise their ratings and permit finer discrimination than a simple "rate each profile in turn" system. Most raters reported taking about 1.5–2 hours to complete the rating task, although a few reported times as high as 6–12 hours.

The first stage in the analysis was to determine the agreement among panel members concerning the relative suitability of the candidates' education. Analysis revealed that nineteen of the 23 raters correlated positively with the mean rating. Two raters showing low negative correlation were deleted from the samples, while two raters with high negative correlation were retained after adjusting the scale reversal involved. The raw scores were standardized by adjusting to a mean of five and a standard deviation of one, and the interrater agreement was measured using the intraclass correlation technique (Lindquist, 1953). The results were:

$$n = 21 \qquad R_{11} = .427 \qquad R_{kk} = .939$$

Capturing Rater Policy

This interrater reliability shows that with the profile information provided, administrative officers exhibit a high level of agreement on the relative educational suitability of anonymous graduates for assignment to the administrative utilization field. The next stage in the analysis was to determine what factors had been used by the panel members in reaching their decision.

A set of 50 variables was defined to quantify the data on the profiles. These variables, listed in Appendix E, include the college major, profile scores in semester hours, grade point average, and 13 college quality scores (Astin, 1965), five of which relate to the academic quality of the freshmen entering the particular college and eight to the college environment. The Astin variables were not explicitly available to the raters as a display on the profile, but were implicitly available depending on the rater's knowledge of, and attitude toward, the college named on the profile.

The mean adjusted rating on each of these 100 profiles was accepted as the best measure of suitability for service in the administrative career field (criterion), and the 50 variables quantifying the data in the education profiles are potential predictors of this criterion. However, to use all 50 of them as predictors in a multiple regression equation would be futile. Regression weights so obtained would be impossible to interpret, particularly as the linear dependencies between the predictors prevent a unique solution. Furthermore, the use of 50 predictors to compute a best fit regression equation from 100 cases would be over-fitting, capitalizing too much on chance relationships.

The approach taken was to seek much smaller groups of linearly independent predictors that could efficiently predict the criterion. The resulting mathematical model would be relatively easy to interpret, and would establish the feasibility of a practical methodology for evaluating suitability of educational qualifications for service in particular areas of specialization. One such set, containing 10 predictors accounted for over 93% of the criterion variance. Details of the regression equation are presented in Table 2.

Table 2. **Regression Equation Using 10 Education Variables to Predict Suitability for Service in the Administrative Career Field**

Variable	Variable Description	Mean	SD	Standard Weight	Regression Weight	Predictor/ Criterion Correlation
21	Social, Behavioral, Educational or Political Sciences	29.63	22.05	.340	.0155	.171
23	Basic Communication Skills	7.83	5.32	.259	.049	.322
24	Administration or Management	1.56	2.92	.238	.082	.590
25	Business Studies	8.40	13.52	.576	.043	.742
26	Law	1.09	3.66	.091	.025	.407
27	Military Studies	15.41	7.20	.171	.024	.058
31	Engineering & Physics Area Score (Sum of Variables 13–18)	16.13	23.43	−.262	−.011	−.507
32	Other Sciences Area Score (Sum of Variables 19–22)	48.67	25.79	−.190	−.007	.085
36	Existence of Grade Point Average (GPA) (0 or 1)	0.30	0.46	.150	.327	.235
37	Grade Point Average (GPA)	1.99	1.36	.299	.222	.206

Note. Regression Constant = 3.324.
Multiple Correlation Coefficient (R) = 0.9651.
Multiple Correlation Coefficient Squared (R^2) = 0.9315.

Inspection of the standard weights of the various predictors in the regression equation reveals which aspects of the education profile make positive contributions to the criterion, and which make negative ones. A large number of semester hours in Officer Managerial Studies Area are most beneficial, particularly in Business Studies (standard weight = .58). In this group, Law, with a standard weight of .09, makes the least contribution. The various elements of this group do make individual contributions; pooling them together as a single variable reduces the squared multiple regression correlation coefficient from .93 to .89. Numerous hours of Engineering and Physics (standard weight = −.26) are a distinct disadvantage. Except for Social, Behavioral, Educational or Political Sciences which are desirable (standard weight = .34), Other Sciences also have a negative contribution (standard weight = −.19). However, the effect of these two areas is not as great as the standard weights would indicate because of the relationship between the two variables. GPA is also a strong predictor of suitability; the higher the GPA the more suitable the profile. Note that "existence of a grade point average" must be included as a predictor to avoid undue penalty to the 30% of the candidates without a GPA.

IV. CONCLUSIONS AND RECOMMENDATIONS

This research effort has established that college transcripts can be condensed and quantified into education profiles with a high degree of reliability. Experts can use such profiles to rate candidates on educational suitability for service in the Administrative Officer Utilization Career Field. These ratings can be duplicated with a high degree of accuracy using only a few quantified aspects of the education profile, the best predictors being number of semester hours completed in certain fields of study plus the candidate's grade point average (if he has one). This research therefore establishes the feasibility of a methodology that translates college transcripts into education suitability indices, at least for some utilization fields.

This was a pilot methodological study. The restrictions created by using a non-random sample of raters is acceptable in this context, but would not be acceptable in developing an operational instrument. This research has studied one utilization field only; further research is necessary to confirm that it could be applied to any utilization field. To have the same 100 profiles rated on suitability for pilot and navigator utilization fields and repeating the analysis would be particularly fruitful follow-on research.

The operational instrument that could be developed from this research would condense college transcripts into the standard education profiles, and then compute an educational suitability index for various officer utilization fields. This index could then be used, along with other pertinent data, for assignment to utilization fields.

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Air Force Manual 50-5. *USAF formal schools catalog*. Washington: Department of the Air Force, September 1974.

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APPENDIX A: OFFICER EDUCATION PROFILE AND DEFINITION OF EDUCATION CATEGORIES PROFILE

PROFILE

	Degree	Major	College
1			
2			
3			

Education Profile			(Semester Hours)
Math	Calculus		
	Probability or Statistics		
	Other Mathematics		
Engineering and Physics	Acrospace Engineering		
	Mechanical Engineering		
	Electrical or Electronic Engineering		
	Civil or Architectural Engineering		
	Other Engineering		
	Physics		
Other Sciences	Other Physical Sciences		
	Biological, Agricultural or Medical		
	Social, Behavioral, Educational or Political		
	Computer Programming or Use		
Officer Managerial Studies	Basic Communication Skills		
	Administration or Management		
	Business Studies		
	Law		
	Military Studies		
General Studies	Arts, Fine Arts, Humanities		
	Miscellaneous		
Grade Point Average		Total	

Appendix A (Continued)

DEFINITIONS OF EDUCATIONAL CATEGORIES

No.	Title	Definitions/Examples/Exclusions
1.	Calculus	Courses specifically designated Calculus. Includes composite titles such as Calculus 3 with Vectors, Analytical Geometry/Calculus I.
2.	Probability or Statistics	Courses where these topics are specifically designated or strongly implied. Includes Introductory Statistics, Business Statistics, Measurement in Education, Psychometrics, etc.
3.	Other Mathematics	Courses in Pure or Applied Math other than those previously listed. Includes various algebras and geometries, complex variable, mechanics, statics, dynamics, etc., also courses listed as Mathematics without any clarification; e.g., Math III. Excludes applied mechanics or dynamics; e.g., Thermodynamics (Physics); fluid mechanics, mechanics of vibrations (Mechanical Engineering).
4.	Aerospace Engineering	Courses studying aeronautical, astronautical or aerospace vehicles or systems. Includes aerodynamics.
5.	Mechanical Engineering	Courses specifically designated, or courses in design and construction of non-flying machines. Includes fluid dynamics, vibration mechanics, etc.
6.	Electrical or Electronic Engineering	Includes computer design.
7.	Civil or Architectural Engineering	Courses specifically designated, or courses in design and construction of buildings, towns, etc.
8.	Other Engineering	Includes all engineering courses not previously listed; e.g., Chemical, Industrial, Human Factors, Systems, Safety, Drafting, Engineering I (unspecified), Engineering Laboratory (unspecified), etc.
9.	Physics	Includes Engineering Science, Astronomy, Meteorology, Thermodynamics, etc.
10.	Other Physical Sciences	Includes all physical sciences other than Physics; e.g., Chemistry, Earth Science, Geology, Photography, etc.
11.	Biological, Agricultural or Medical Sciences	Includes Pharmacy.

Appendix A (Continued)

No.	Title	Definitions/Examples/Exclusions
12.	Social, Behavioral, Educational, or Political Sciences	Includes Anthropology, History, Geography, Political Science, Sociology, Psychology, Education, etc.
13.	Computer Programming or Use	Courses specifically designated. Includes Elements of Computer Programming, Mechanical Languages, etc. Excludes Computer design.
14.	Basic Communications Skills	Courses in written or oral communication skills relevant to AF jobs. Includes English composition, report writing, journalism, Freshman English (unless the transcript shows the emphasis to lie in the Fine Arts area), Fundamentals of Speech, etc. Excludes Fine Arts studies such as literature, poetry, drama, etc.
15.	Administration or Management	Courses specifically designated Administration or Management in any discipline except Military Studies. Includes Personnel Management, Engineering Management, Public Administration, etc. Excludes AFROTC Management or Administration courses.
16.	Business Studies	Includes Accounting, Economics, Marketing, Advertising, etc.
17.	Law	Excludes Military Law.
18.	Military Studies	AFROTC, etc. Includes Military Administration, Management, Law.
19.	Arts, Fine Arts, Humanities	Includes Literary Studies, Foreign Languages, art, music, philosophy, religion, etc.
20.	Miscellaneous	Courses which cannot be rationalized within the above categories. Includes Golf, Commercial Flight I, Physical Conditioning, etc.

APPENDIX B: PROFILE SCORE SHEET

Scorer No. _____ Transcript No. _____

Profile Score Sheet

	Rubric	Tally	Raw Score	Semes Hrs
1	Calculus			
2	Probability/Statistics			
3	Maths Other			
4	Computer Use/Programming			
5	Physics			
6	Aerospace Engineering			
7	Mechanical Engineering			
8	Civil/Architectural Engineering			
9	Electronic/Electrical Engineering			
10	Engineering Other			
11	Physical Science, Other			
12	Biological/Agricultural/Medical Science			
13	Communications Skills			
14	Administration/Management			
15	Business Studies			
16	Education/Social/Behavioral Sciences			
17	Law			
18	Arts/Fine Arts/Humanities			
19	Military Studies			
20	Miscellaneous			
			Total Semester Hours _____	

APPENDIX C: INSTRUCTIONS FOR USE OF PROFILE SCORE SHEET

1. You are requested to score each of the 50 transcripts herewith, using the appropriate scoring sheet for each.

2. Read the definitions of the 20 rubrics carefully. It is necessary to perceive the intention of each rubric and also those subjects specifically included or excluded.

3. For each transcript in turn:

   a. Decide whether the transcript is scored in Semester hours, Credit hours or Units.

   b. Study the Grading Scale. Only courses in which the candidate scores a passing grade or better are to be counted. Strike out scores relating to failures, withdrawals, incompletes, etc.

   c. For each course in turn, decide on the most appropriate rubric. It may be necessary to consider department and course code to make a final decision.

   d. Enter the hours (or units) earned on the tally sheet. Ignore quality or grade point scores - only hours earned are required.

   e. Total the tally score for each rubric and convert to Semester hours using:

      1 quarter hour = 3/4 semester hour
      1 unit = 4 semester hours

   f. Total the semester hours. Final scores should be of the order 120 - 140 semester hours for the undergraduate transcripts being examined.

APPENDIX D: TYPICAL COMPLETE OFFICER EDUCATION PROFILE

	Degree	Major	College
1	BA	English	Hendrix College, Ark.
2			
3			

Education Profile		(Semester Hours)	
Math	Calculus		
	Probability or Statistics	1	
	Other Mathematics	2	3
Engineering and Physics	Aerospace Engineering		
	Mechanical Engineering		
	Electrical or Electronic Engineering		
	Civil or Architectural Engineering		
	Other Engineering		
	Physics		
Other Sciences	Other Physical Sciences		
	Biological, Agricultural or Medical	6	
	Social, Behavioral, Educational or Political	19	
	Computer Programming or Use		25
Officer Managerial Studies	Basic Communication Skills	4	
	Administration or Management		
	Business Studies		
	Law		
	Military Studies		4
General Studies	Arts, Fine Arts, Humanities	71	
	Miscellaneous	4	75
Grade Point Average 3.18		Total	107

APPENDIX E: PREDICTOR VARIABLES USED TO QUANTIFY DATA IN EDUCATIONAL PROFILES

1. College Major in Agricultural, Biological or Medical Science = 1, 0 otherwise
2. College Major in Business Studies = 1, 0 otherwise
3. College Major in Psychology or Education = 1, 0 otherwise
4. College Major in Engineering = 1, 0 otherwise
5. College Major in Fine Arts = 1, 0 otherwise
6. College Major in Mathematics = 1, 0 otherwise
7. College Major in Physical Sciences = 1, 0 otherwise
8. College Major in Political Sciences = 1, 0 otherwise
9. College Major in Social Sciences = 1, 0 otherwise
10. Calculus Score
11. Probability or Statistics Score
12. Other Mathematics
13. Aerospace Engineering
14. Mechanical Engineering
15. Electrical Electronic Engineering
16. Civil or Architectural Engineering
17. Other Engineering
18. Physics
19. Other Physical Sciences
20. Biological, Agricultural or Medical Sciences
21. Social, Behavioral Educational or Political Sciences
22. Computer Programming or Use
23. Basic Communication Skills
24. Administration or Management
25. Business Studies
26. Law
27. Military Studies
28. Arts, Fine Arts, Humanities
29. Miscellaneous
30. Maths Area Score
31. Engineering and Physics Area Score
32. Other Sciences Area Score
33. Officer Managerial Studies Area Score
34. General Studies Area Score
35. Education Profile Total Score
36. Existence of Grade Point Average (Score 0 if score exists, 1 otherwise)
37. Grade Point Average
38. Intellectualism
39. Estheticism
40. Status
41. Pragmatism
42. Masculinity
43. Selectivity
44. Size
45. Realistic Orientation
46. Scientific Orientation
47. Social Orientation

Appendix E (Continued)

48. Conventional Orientation
49. Enterprising Orientation
50. Artistic Orientation

*[Predictors 10–35 are semester hours and predictors 38–50 relate to College Quality Scores–see "Who Goes Where to College" by Astin, A.W.].

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